MEMORANDUM

January 23, 2009

To: Tyneshia Tate, NOx Unit
Thru: Jim Boylan JB
From: Pete Courtney PSC
Subject: **Yellow Pine Energy – Clay County, GA** – Greenfield Biomass Power Project PSD model review

Air dispersion modeling was conducted by Yellow Pine Energy's (YPE) consultant, CH2MHill (CH2M), to assess conformance of proposed emission limits for the subject emission point and other emission sources on site with the Georgia EPD *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions* (the Guideline) and applicable federal Prevention of Significant Deterioration (PSD) air quality standards. This memo discusses the procedures used to review the supporting dispersion modeling. NO_x, PM10/PM2.5, SO_2, VOC, and CO are the criteria air contaminants projected to be emitted by the project in excess of their respective Significant Emission Rates. Emissions of VOC will exceed 100 tpy. The project differs from that described in the application, in that only biomass and a maximum of 15 % (by Btu content) of tire-derived fuels (TDF) are to be permitted. The TDF will initially be permitted to be used in limited trial burns until the emissions can be better characterized. This reduces the potential impact of the project, mostly as regards SO2 impacts. No attempt was made to eliminate or reduce the air toxics contaminants initially projected to be emitted due to combustion of coke or coal.

INPUT DATA

1_ **Meteorological Data** – Hourly pre-processed meteorological data from the Columbus, GA NWS surface station and the Centreville, AL NWS upper air station for the period 1989-93 were used to evaluate the proposed emission rates for conformance with the standards cited above via AERMOD. The data were filled in, and processed through AERMET (version 06341) by GA EPD dispersion modeling staff, and provided to CH2M. The air toxics modeling implemented ISCST3-compatible meteorological data, collected at the same stations, but over the years 1985-89. These data were downloaded from the GA EPD website, and the modeling review employed the website data. Class I Significance modeling employed the 3 years of data (2001-2003) initially prepared by VISTAS, and subsequently re-processed through CALMET (version 5.8, level 070623) by Tim Allen of the U.S. Fish & Wildlife Service in July, 2007.

2_ **Source Data** – Stack emissions parameters, emission rates, and boundary and initial gridded model receptors were provided by CH2M and have been subjected to GA EPD engineering review. Following resolution of the revised SO2 24-hour Significant Impact Distance (SID) to 100m (2.3 km), a new 100m-spaced receptor grid was developed by GA EPD staff and the onsite receptors and receptors located outside the SID were eliminated. Elevations for these receptors were assigned by GA EPD staff re-running the AERMAP processor. The emission parameters for the respective sources are located in the Project application/report, Tables 4-1 and 4-2. The consultant examined a 100% operating capacity scenario and an 80% scenario. The highest impacts resulted from modeling the 100% scenario, and that worst-case scenario was used in all subsequent modeling. The emissions data for coal and coke combustion were not evaluated in this review. Appendix E of the CH2M report presents the calculations of the various emission rates modeled. Maximum air toxics emission rates are summarized on Table 7-10 of the application, from fuel-scenario-specific information in Appendix E.

3_ **Models Used** – The AERMOD model (version 07026) was used to evaluate project significance impacts and conformance with National Ambient Air Quality Standards

(NAAQS), and Class II Area PSD Increments. The Building Profile Input Program (version 04274) was used to derive building dimensions appropriate for the AERMOD model.

Air toxic contaminant concentrations were modeled with the SCREEN3 (version 96043) model. The modeled 1-hour time-weighted average concentrations were adjusted to 15-minute, 24-hour, and annual time-weighted average concentrations using the factors provided in the Guideline. The ISCST3 model (version 02035, without building downwash) was implemented to refine the concentrations of arsenic and silver, as recommended by the Guideline.

The CALPUFF model (version 5.8, Level 070623 & CALPOST 5.6394 was used to evaluate the project SO_2 Class I Significance concentrations against proposed EPA Significance Threshold Concentrations (or Significant Impact Levels) at the Bradwell Bay NWA and St. Marks NWR Class I areas.

4_ **Receptors** – Gridded and boundary model receptors in the Class II area were assigned terrain elevations using as many as 30 surrounding Digital Elevation Model data files at a scale of 1:24,000 (7.5 minute USGS quadrangle files) by processing the files through the AERMAP (version 06341) utility program. The boundary receptors were located at intervals of less than 100 meters along the property line. For significance modeling, a 100-meter spaced gridded receptor network extending approximately 1 kilometer from the site boundary in all directions was used, supplemented by gridded receptors spaced 250-meters apart between 1 and 5 km, and 500 m from 5 km to 10 km. Refinement of the 24-hour averaged SO2 Significant Impact Distance (SID) to 100 m indicated the only SID to be 2.3 km from the main boiler stack. A 4.6 km sq grid of 100 m receptor locations was re-processed through AERMAP. These were filtered with a spreadsheet to a 2.3 km radius from which the receptors located on the site were removed. This receptor set was used to assess the refined NAAQS and Class II PSD Increment consumption.

Class I Area boundary and internally-gridded, 1-km spaced receptors were used to assess Class I Significance of the SO_2 project emissions. Terrain elevations were packaged with the horizontal Lambert Conformal Conic coordinates as the receptors from the Bradwell Bay and St. Marks Class I areas were extracted from the National Park Service/U.S. Fish and Wildlife air dispersion model receptor database. The LCC coordinates were converted to Universal Transverse Mercator coordinates, Zone 16, or vice-versa using the conversion utility, which accompanies the database.

5_ **Offsite Source Inventory** – Only offsite sources within Early County (Longleaf Energy and Georgia Pacific) were involved in the assessment of NAAQS and Class II Increment. These sources were 20-40 km away from the project site. The next closest other large sources were at least 80 km away, well beyond the SID + screening area (52.3 km). The Alabama Department of Environmental Management was contacted to assist in developing a list of offsite facilities in that state within 53.2 km of the project. They responded that they knew of no facilities in Alabama which would contribute to the refined modeled offsite impacts analysis.

6_ **AAC Calculations** – Acceptable Ambient Concentrations (AACs) were calculated according to the Guideline, as shown on the accompanying table. All air toxics assessed, except silver, were found to conform to the Guideline allowable concentrations (AACs). See attached table of model results and AAC concentrations.

7_ **Class I Impacts Assessment** - The maximum sum of visibility-affecting pollutants due to the project that will be permitted is 1294 tpy. The distance to the nearest Class I Area is to Bradwell Bay, some 165 km away from the project. This yields a Q/D ratio of 7.8, which is less than the ratio value of 10 currently used by the FLM as a threshold, above which projects are typically required to assess Air Quality Related Values (AQRV) in nearby Class I areas. The FLM of Bradwell Bay sent a letter indicating an AQRV analysis of impacts on Bradwell Bay would not be necessary. While no communication has been received from the FLM of St. Marks, that Class I area is farther away from the project. The CALPUFF model was used to assess the maximum predicted 3-hr, 24-hr, & annual average SO_2 concentrations from the main boiler fired with biomass and TDF fuels over the 3-year modeled period. These SO_2 concentrations were substantially below the respective Class I Area Significance Threshold concentrations proposed by EPA, confirming that an AQRV analysis would be an excessive imposition on the project, and indicating the Class I increments are not threatened by this project.

8_ **Ozone Impacts Assessment** – Clay County is currently designated to be in attainment of the applicable 8-hr average ozone National Ambient Air Quality Standard. The closest ozone ambient air monitor operated by GA EPD is located in Sumter County, which is rural yet has a population greater than Clay County. Since 2002, the highest 4th high, 8-hour averaged ozone concentration has generally been monitored in the low 0.070 ppm range. The current attainment status of the area for ozone is based on the average of the last 3 years of the highest 4th high 8-hour averaged ozone concentrations. The monitor in Sumter County is maintained and calibrated by GA EPD. It is located close enough to Clay County to be considered representative of rural ambient air ozone levels throughout the area. The most recent data (2008) indicates this three-year average of highest 4th highs to be 0.074 ppm, lower than the 8-hour standard. NO_2 emissions are regarded as contributing to ozone formation in the air. The project NO_2 emissions do not exceed significant impact levels, and are therefore considered to be an acceptable addition to the air quality in the area.

9_ **Additional Impacts Analysis** – The consultant, CH2M, points out that the Class II area impacts of the project are less than the respective Class II Significant Impact Levels (SILs), except for 24-hour SO_2. The maximum 24-hour averaged SO_2 concentrations modeled only exceed the SIL to a distance of 2.3 km from the plant. The maximum-modeled 24-hour SO_2 concentration from the project was 10.4 $\mu g/m^3$.

The 3-hour SO_2 NAAQS (1300 $\mu g/m^3$) is a secondary standard which was developed to be protective of public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The maximum-modeled 3-hour SO_2 concentration from the project was 21.7 $\mu g/m^3$. The EPA publication, *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals*, (1980) indicates that for sensitive plants, a protective 3-hour average threshold concentration may be about 786 $\mu g/m^3$. The maximum SO_2 3-hour concentration is below this concentration, as well. Since the other criteria pollutants are below their respective time-weighted significant concentration levels, no significant impact is expected from the project on it's surroundings.

No potentially sensitive Class II visible plume receptors were identified within the 2.3 km SID of the facility. An SID was only determined for 24-hour SO_2 emissions. Class II visible plume impaction is normally assessed using the VISCREEN model, which does not evaluate impacts of SO_2 emissions. For these reasons, no Class II Visible Plume impacts were required to be assessed.

The consultant indicates that 32 employees are expected to be hired to operate the facility after it is constructed, and that construction hiring is expected to draw heavily from the existing local labor pool. These impacts seem inconsequential.

RESULTS OF MODELING

The criteria pollutant modeling results are presented on the Model Request forms (attached). Tables III-2 and IV show conformance with all of the applicable PSD Class II Increments and NAAQS for the criteria contaminants modeled. The modeled concentrations of criteria pollutants assessed with the AERMOD model, were below Class II significance levels, with the exception of 24-hour averaged SO_2. The Calpuff model predicted impacts at the two Class I areas which are well below Class I significant Impact levels, confirming no further modeling is required. The modeled concentrations are summarized on the attached Model Request Forms.

The only air toxics contaminant which was indicated not to conform to its respective AAC was silver. Silver was subjected to refined modeling with the ISCST3 model to determine an emission limit which would allow conformance with the 24-hour averaged AAC. The limit was calculated to be 0.63 pounds-per-hour from the main boiler stack, the only source of silver in the application. The emission rate of silver is based on only one stack test and is rated "D".

No physical barrier to public access appears delineated on the project site map. A condition requiring such a barrier needs to be included in the permit, or the modeling should be re-visited.

The facility submitted a modeled load analysis of worst-case impacts at 100% of operating capacity, and at 80% of operating capacity. The 100% capacity model produced higher impacts and more extensive significant impact distances. The modeling review was conducted at the 100% load capacity, though the significant impact distance resolved was influenced by discounting coal and coke as potential fuels for the project.

Fugitive PM10 emissions were modeled. PM10 emissions were modeled and compared against PM10 standards. Compliance of the PM10 emissions with PM10 standards is regarded as a surrogate for modeled PM2.5 compliance assessments, in accordance with current EPA recommendations.

Complex terrain issues were not a factor in the review since the AERMOD model is capable of assessing contaminant impacts in complex terrain.

Attachments: Model Request Forms
Tabulated Results of Air Toxics Modeling

REQUEST FOR MODELING ANALYSIS

I. ENGINEERING INPUT

Engineer Requesting: Tyneshia Tate Date: February 4, 2008

Emissions/Process Reviewed By: _____ Date: _____

Desired Modeling Completion Date: Mid March 2008

Project type(s): PSD __X__ ; Toxics __X__ ; Quarry _____ ; BART _____

Application No.: 17700 Permit Reference No.: _____

A. Source Information

- Facility Name: Yellow Pine Energy Company, LLC
- Location (City & County): Fort Gaines, Clay County
- Criteria Pollutants emitted in significant amounts (tpy):

Project:	NO_X	_____*	Plant-Wide:	NO_X	670
	SO_2	_____*		SO_2	402
	PM_{10}	_____*		PM_{10}	222
	CO	_____		CO	2,009
	VOC	_____		VOC	134
	Lead	_____		Lead	___
	H_2SO_4	_____*		H_2SO_4	None Reported

*Visibility-affecting pollutant

- Date emissions data verified? _____
- NAAQS and Increment have explicit pollutant-specific time-weighted averaging periods. If the project is to have short-term emission rates that differ from annual emission rates presented above (divided by the applicable time-weighting averaging period), please attach such information (in lbs/hr of pollutants with rates other than annual). Example: If maximum hourly rate not = to annual rate/8760 hrs-per-year X 2000 pounds-per-ton, then what is maximum hourly rate, etc.?
- Is data provided sufficient to accurately inventory the PSD Increment? yes
- Attach plot plan of the facility that shows property lines, building locations and emission points, & receptor locations.
- **ATTACH MODELING CD OR FILES!**

A copy of this application and associated modeling files have been previously provided to modeling.

B. Background Information

- PSD baseline dates: SO_2 12/03/08 PM_{10} 12/03/08 NO_2 12/03/08
- Modeling to be conducted for: PSD Increment Class I _X_, Class II _X_ NAAQS _X_, Preconstruction monitoring ___X___, BART Visibility _____
- If there are Class I areas within 200 km of the source, OR if Q/D > 4, where Q= tpy of visibility-affecting pollutants to be emitted by the project, and D= facility-to-Class I Area distance (km):

  distance to Bradwell Bay Wilderness area(s) is 165 km.

  distance to St. Marks National Wildlife Refuge area(s) is180 km.

  distance to _____area(s) is _____km.

  distance to _____area(s) is _____km.
- Is modeling to include fugitive emissions (Yes/No)? yes If yes, are fugitive emissions adequately characterized in report (Yes/No)? yes
- If any actual stack height is less than its GEP stack height, attach BPIP model output table (provided by applicant).
- Are emission rates modeled allowable limits? yes
- Periods of operation if other than 24 hours/day, 7 days/week:

  Source Code: _____ Hours per day _____ Days per week _____
- Are complex terrain issues identified or considered in the report? no

  If VOC emissions are to increase by more than 100 tpy, is an ozone impacts analysis included in the application? yes
- Are Class II visibility issues addressed? yes
- Are additional impacts (soils, vegetation, & growth) addressed? yes
- Remarks or additional information: Facility has been requested to update emissions with start up and shutdown operation scenarios for the proposed fluidized boiler(s). In addition the facility has been requested to address potential fugitive emissions estimates.

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE (from application, BPIPprm 04274)
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	Prelim* GEP** EQN1	GEP Stack Height Value
BOILER	64.01	0.00	101.90	101.90
AUXBOIL	30.48	0.00	98.00	98.00
FPB1	7.32	N/A	0.00	65.00
FPB2	7.32	N/A	0.00	65.00
SILO	56.69	0.00	99.42	99.42
FLYSILO	56.69	0.00	105.78	105.78

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

II. INITIAL {SIGNIFICANCE TEST} MODELING RESULTS (project emissions only!)

Date completed: 01/22/09 ; By: PSC

TABLE II-1: Project Impacts VS. Significance Level (CLASS I AREAS)

Criteria Pollutant	Averaging Period	Significance Level	Maximum* Project Concentration	Receptor UTM Zone: 16		Model Met Data Period
		($\mu g/m^3$)	($\mu g/m^3$)	X (m)	Y (m)	[yymmddhh]
SO_2	Annual	0.1	0.0031	736995.5	3346563.6	2002 – BRADWELL BAY
			0.0029	770095.7	3339009.8	2002 – ST. MARKS
	24-Hour	0.2	0.069	729050.2	3342697.9	02122724 – BB
			0.082	769315.7	3338066.3	02112824 – SM
	3-Hour	1.0	0.185	737837.9	3343632.	01092506 – BB
			0.198	770231.4	3333465.8	03020712 - SM
PM_{10}	Annual	0.2	NR	NR	NR	NR
	24-Hour	0.3	NR	NR	NR	NR
NO_2	Annual	0.1	NR	NR	NR	NR

*Highest concentration - = ALL averaging periods

TABLE II-2: Project Impacts VS. Significance Level (CLASS II AREAS)

Criteria Pollutant	Averaging Period	Significance Level	Maximum Highest Project Concentration*	Receptor UTM Zone: 16		Model Met Data Period	Significant Impact Distance
		($\mu g/m^3$)	($\mu g/m^3$)	X (m)	Y (m)	[yymmddhh]	(km)
SO_2	Annual	1	0.9495	685500.	3488500.	1991	NA
	24-Hour	5	10.4	686400.	3489700.	93022124	**2.3**
	3-Hour	25	21.7	686500.	3488200.	91100609	NA
PM_{10}	Annual	1	0.667	685714.	3488710.	1990	NA
	24-Hour	5	3.94	685714.	3488710.	90102724	NA
NO_2	Annual	1	0.633	685600.	3488500.	1991	NA
CO	8-Hour	500	32.3	686800.	3489600.	91030624	NA
	1-Hour	2000	54.2	686400.	3489200.	89050512	NA

*Highest concentration = ALL averaging periods

- IF MAXIMUM PROJECTED CONCENTRATION EXCEEDS THE SIGNIFICANCE LEVEL FOR ANY AVERAGING PERIOD, REFINED NAAQS / INCREMENT ANALYSIS IS REQUIRED FOR THAT POLLUTANT.
- Maximum Significant Impact Distances used to define pollutant-specific modeling areas are indicated in Bold font.
- NA: The Significant Impact Concentration for the pollutant/averaging period was not exceeded, no significant impact distance could be determined.
- NR: The pollutant concentrations over this averaging period did not exceed Class II Significance levels, therefore no further modeling was required.

Source: Yellow Pine Energy Company, LLC

TABLE II-3: Project Pollutant Monitoring *De Minimus* Impacts

Pollutant	Averaging Period	*De Minimus* Concentration	Projected* Concentration	Receptor UTM Zone: 16		Model Met Data Period
		($\mu g/m^3$)	($\mu g/m^3$)	X (m)	Y (m)	[yymmddhh]
CO	8-Hour	575	32.3	686800.	3489600.	91030624
NO_2	Annual	14	0.633	685600.	3488500.	1991
PM_{10}	24-Hour	10	3.94	685714.	3488710.	90102724
SO_2	24-Hour	13	10.4	686400.	3489700.	93022124
Pb	3-Month	0.1	NE	NE	NE	NE
Hg	24-Hour	0.25	NA	NA	NA	NA
Be	24-Hour	0.001	NA	NA	NA	NA
Fl	24-Hour	0.25	NE	NE	NE	NE
Vinyl Chloride	24-hour	15	NA	NA	NA	NA
Total Reduced S	1-Hour	10	NE	NE	NE	NE
H_2S	1-Hour	0.2	NE	NE	NE	NE
Reduced S Compounds	1-Hour	10	NE	NE	NE	NE

*Highest concentration off property

- AUTOMATIC EXCLUSION FROM PRE-CONSTRUCTION MONITORING IF PROJECTED CONCENTRATION LESS THAN *DE MINIMUS*. (Yes/No) Yes
- Model(s) used: AERMOD 07026

  Met. data: Year(s) 1989-1993

  Surface data from Columbus, GA NWS station

  Upper air data from Centreville, AL NWS station
- Receptor information: All maximum modeled de minimis concentrations are resolved to the nearest 100 meters
- Remarks of additional information: No modeled pollutant impact exceeded an applicable *de minimis* monitoring concentration, so no pre-construction monitoring is required for any pollutant.

_NA: A *de minimis* Pre-construction Monitoring Concentration no longer exists for this pollutant.

_NE: Pollutant is not emitted in excess of the applicable Significant Emission threshold.

III. FINAL MODELING RESULTS – PSD INCREMENT

TABLE III-1: CLASS I AREA Increment Assessment – All Relevant Sources

Pollutant	Averaging Period	Allowable Increment	Maximum* Increments Consumed	Receptor UTM Zone: 16		Model Met Data Period
		($\mu g/m^3$)	($\mu g/m^3$)	X (m)	Y (m)	[yymmddhh]
SO_2	Annual	2	< Significance	< Significance	< Significance	< Significance
	24-Hour	5	< Significance	< Significance	< Significance	< Significance
	3-Hour	25	< Significance	< Significance	< Significance	< Significance
PM_{10}	Annual	4	NR	NR	NR	NR
	24-Hour	8	NR	NR	NR	NR
NO_2	Annual	2.5	NR	NR	NR	NR

*Off property concentrations:
Highest concentration: annual averaging periods
Highest, second highest concentration: 24-hour and 3-hour averaging periods

- Models used: CALPUFF 5.8 Level 070623 & CALPOST 5.6394
  Met. data: Year(s) VISTAS-sponsored, U.S. F&WS processed CALMET output files, 2001, 2002, & 2003
  Surface data from 206 surface stations in the VISTAS region
  Upper air data from 13 Upper air stations in the VISTAS region
- Fugitive emissions included in model? No
- Remarks or additional information: The CALMET model also processed MM4/MM5/3D.dat output files in developing the CALMET output files.

NR: Modeled assessment is not required since Class II impacts do not exceed applicable Significant Impact Levels.

TABLE III-2: CLASS II AREA PSD Increment Assessment, All Relevant Sources

Pollutant	Averaging Period	Allowable Increment	Maximum* Increments Consumed	Receptor UTM Zone: 16		Model Met Data Period
		($\mu g/m^3$)	($\mu g/m^3$)	X (m)	Y (m)	[yymmddhh]
SO_2	Annual	20	NR	NR	NR	NR
	24-Hour	91	13.71	686300.	3489600.	91032224
	3-Hour	512	NR	NR	NR	NR
PM_{10}	Annual	17	NA	NA	NA	NA
	24-Hour	30	NA	NA	NA	NA
NO_2	Annual	25	NA	NA	NA	NA

*Off property concentrations:
Highest concentration: annual averaging periods
Highest, second highest concentration: 24-hour and 3-hour averaging periods

- Models used: AERMOD (07026)

  Met. data: Year(s) 1989-1993

  Surface data from Columbus, GA NWS

  Upper air data from Centreville, AL NWS

- Fugitive emissions included in model? No SO2 fugitive emissions are expected from the sources modeled.

- Remarks or additional information:

  NR: Not required because of insignificant project impacts

  NA: Not applicable since no significant project impacts were predicted for this pollutant

  Offsite inventory restricted to Longleaf Energy and Georgia Pacific, Cedar Springs, both located in Early County.

  Other major offsite sources are located in excess of 80 km from the project.

IV. FINAL MODELING RESULTS – NATIONAL AMBIENT AIR QUAILITY STANDARDS (NAAQS)

Source: Yellow Pine Energy Company, LLC

TABLE IV-1: Projected Impact – NAAQS (NA=not applicable; NR= not required)

Pollutant	Averaging Period	All Source Impact	Total* Impact	NAAQS	Receptor UTM Zone: 16		Model Met Data Period
		($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	X (m)	Y (m)	[yymmddhh]
SO_2	Annual	NR	NR	80	NR	NR	NR
	24-Hour	13.56	34.56	365	686300.	3489600.	91032224
	3-Hour	NR	NR	1300	NR	NR	NR
PM_{10}	Annual	NA	NA	50	NA	NA	NA
	24-Hour	NA	NA	150	NA	NA	NA
NO_2	Annual	NA	NA	100	NA	NA	NA
CO	8-Hour	NA	NA	10,000	NA	NA	NA
	1-Hour	NA	NA	40,000	NA	NA	NA
Pb	3-Month	NA	NA	1.5	NA	NA	NA

*Total impact equals source impact, plus impact from offsite sources, plus background

Background Concentrations ($\mu g/m^3$)				
Averaging Period	SO_2	PM_{10}	NO_2	CO
Annual	NR	NA	NA	--
24-Hour	21.	NA	--	--
8-Hour	--	--	--	NA
3-Hour	NR	--	--	--
1-Hour	--	--	--	NA

- Origin(s) of other sources' emission data:

  Actual emissions _____ Allowable emissions __√__ AIRS/EI02 _____, if yes has data been verified? Yes

  Engineering review _____

- Have other sources been checked for GEP stack height? Yes

  Was actual ___√_____ or GEP _____ height used in the model?

- Model(s) used: AERMOD (07026)

  Met. data: Year(s) 1989-1993

  Surface data from Columbus, GA NWS

  Upper air data from Centreville, AL NWS

- Computer summary of contributing sources attached (Yes/No)? see modeling review file

- Source of ambient concentrations US EPA website AIRDATA, average of available 24-hour second highest ambient SO2 concentrations over the period 2002-2006 at the GA EPD monitor in Muscogee Co., GA.

*Off-property concentrations:
Highest concentration - annual averaging periods
Highest, second highest concentration – 24-hour – to - 1-hour averaging periods
Highest, 6th high concentration - 24-hour PM_{10} averaging period

V. CLASS II VISUAL PLUME MODEL RESULTS

Level I (VISCREEN) Analysis:

Distance (D_{vis}) beyond which facility-wide emissions are predicted to cause no plume visible impacts under worst-case (F,1) conditions: **None** (<50 km, or SIA, whichever is less)

List of sensitive receptors between 1km and D_{vis} in any direction from the facility (National Parks & Class I Areas, State Parks & Historic Sites, airports, etc.):

No potentially sensitive receptors occur within the 2.3 km significant impact area (SIA) for SO2. SO2 emissions are not assessed by the VISCREEN model. No SIA was determined for NO2 or PM10.

Sensitive Receptor	Closest Distance (km)	Azimuth from facility (°)

Level II (VISCREEN) Analysis:

Determination of Worst-case 1% Cumulative Frequency condition:

Year of Met Data: _____ _____ _____ _____ _____

Met condition (ie., F,2): _____ _____ _____ _____ _____

Sensitive Receptors not passing Level II (VISCREEN) Analysis: _____

Level III Analysis:

Sensitive Receptors not passing Level III (PLUVUE II) Analysis: _____

Mitigating criteria: _____

Air Toxics Review Results
Air Toxics Impact Analysis
Yellow Pine Energy
Clay County, Georgia

HAPs/Toxics Pollutant[1]	Emission Rate (lb/hr)		Total Emission Rate	Averaging Period	Maximum Predicted Concentration	AAC[2]
	FB Boiler	Aux. Boiler	(lb/hr)		(ug/m^3)	(ug/m3)
1,1,1-Trichloroethane	4.74E-02	0.00E+00	4.74E-02	Annual	5.50E-04	5.00E-03
				15-min	9.08E-03	2.45E+05
1,2-Dichloroethane	4.43E-02	0.00E+00	4.43E-02	Annual	5.14E-04	3.85E-01
				15-min	8.50E-03	4.05E+04
1,2-Dichloropropane	5.05E-02	0.00E+00	5.05E-02	Annual	5.86E-04	4.00E+00
				15-min	9.67E-03	5.17E+04
2,3,7,8-Tetrachlorodibenzo-p-dioxins	1.31E-08	0.00E+00	1.31E-08	24-hr	7.63E-10	1.50E-03
2,4-Dinitrotoluene	3.06E-06	0.00E+00	3.06E-06	24-hr	1.78E-07	3.57E+00
2-Chloroacetophenone	7.65E-05	0.00E+00	7.65E-05	Annual	8.88E-07	3.00E-02
				24-hr	4.44E-06	7.52E-01
Acenaphthene	1.39E-03	0.00E+00	1.39E-03	24-hr	8.08E-05	4.76E-01
Acetaldehyde	1.27E+00	0.00E+00	1.27E+00	Annual	1.47E-02	4.55E+00
				15-min	2.43E-01	4.50E+03
Acetone	2.91E-01	0.00E+00	2.91E-01	24-hr	1.69E-02	5.85E+03
				15-min	5.57E-02	1.84E+05
Acetophenone	1.68E-04	0.00E+00	1.68E-04	24-hr	9.75E-06	1.17E+02
Acrolein[3]	1.19E+00	0.00E+00	1.19E+00	Annual	1.38E-02	2.00E-02
				15-min	2.28E-01	2.29E+01
Aluminum	5.28E-03	0.00E+00	5.28E-03	24-hr	3.07E-04	3.57E+01
Ammonia	3.96E+01	0.00E+00	3.96E+01	Annual	4.60E-01	1.00E+02
				15-min	7.58E+00	2.43E+03
Anthracene	4.59E-03	0.00E+00	4.59E-03	24-hr	2.66E-04	4.76E-01
Antimony	1.21E-02	0.00E+00	1.21E-02	24-hr	7.01E-04	1.19E+00
Arsenic[4]	3.36E-02	1.00E-04	3.37E-02	Annual	1.40E-04	2.33E-04
				15-min	5.28E-03	2.00E-01
Barium	2.60E-01	0.00E+00	2.60E-01	24-hr	1.51E-02	1.19E+00
Benzene	6.42E+00	0.00E+00	6.42E+00	Annual	7.46E-02	4.50E-01
				15-min	1.23E+00	8.00E+03
Benzo(a)anthracene	9.94E-05	0.00E+00	9.94E-05	24-hr	5.77E-06	4.76E-01
Benzo(a)pyrene	3.98E-03	0.00E+00	3.98E-03	24-hr	2.31E-04	4.76E-01
Benzo(b)fluoranthene	1.53E-04	0.00E+00	1.53E-04	24-hr	8.88E-06	4.76E-01
Benzo(j,k)fluoranthene	2.45E-04	0.00E+00	2.45E-04	24-hr	1.42E-05	4.76E-01
Benzo(k)fluoranthene	5.50E-05	0.00E+00	5.50E-05	24-hr	3.20E-06	4.76E-01
Benzyl chloride	7.65E-03	0.00E+00	7.65E-03	24-hr	4.44E-04	1.19E+01
				15-min	1.47E-03	5.00E+02
Beryllium	1.68E-03	7.50E-05	1.76E-03	Annual	3.71E-05	4.00E-03
				15-min	6.12E-04	5.00E-01
Biphenyl	1.86E-05	0.00E+00	1.86E-05	24-hr	1.08E-06	2,4E+00
bis(2-Ethylhexyl)phthalate	7.19E-05	0.00E+00	7.19E-05	24-hr	4.17E-06	1.19E+01
				15-min	1.38E-05	1.00E+03
Bromoform	4.26E-04	0.00E+00	4.26E-04	Annual	4.95E-06	9.00E+00
				24-hr	2.47E-05	4.10E+00
Cadmium	6.27E-03	7.50E-05	6.34E-03	Annual	9.03E-05	6.00E-03
				15-min	1.49E-03	3.00E+01
Carbon disulfide	1.42E-03	0.00E+00	1.42E-03	Annual	7.00E-01	7.00E+02
				15-min	2.72E-04	5.40E+03
Carbon tetrachloride	6.88E-02	0.00E+00	6.88E-02	Annual	7.99E-04	6.70E-01
				15-min	1.32E-02	1.57E+04
Chlorine	1.21E+00	0.00E+00	1.21E+00	24-hr	7.01E-02	3.45E+00
				15-min	2.31E-01	3.00E+02
Chlorobenzene	5.05E-02	0.00E+00	5.05E-02	24-hr	2.93E-03	8.21E+02
Chloroform	4.28E-02	0.00E+00	4.28E-02	Annual	4.97E-04	4.00E-01
				15-min	8.20E-03	9.78E+02
Chromium	3.21E-02	7.50E-05	3.22E-02	24-hr	1.95E-03	1.19E+00
				15-min	6.44E-03	1.00E+01
Chromium VI	5.41E-03	0.00E+00	5.41E-03	Annual	6.28E-05	8.00E-05
				15-min	1.04E-03	1.00E+00
Chrysene	5.81E-05	0.00E+00	5.81E-05	24-hr	3.37E-06	4.76E-01
Cobalt	9.94E-03	0.00E+00	9.94E-03	24-hr	5.77E-04	2.38E-01
Copper	7.49E-02	1.50E-04	7.51E-02	24-hr	4.53E-03	2.38E-01
				15-min	1.49E-02	1.00E+01
Crotonaldehyde	1.51E-02	0.00E+00	1.51E-02	24-hr	8.79E-04	1.43E+01
				15-min	2.90E-03	6.00E+02
Cumene	5.79E-05	0.00E+00	5.79E-05	Annual	6.72E-07	4.00E+02
Dimethyl sulfate	5.24E-04	0.00E+00	5.24E-04	24-hr	3.04E-05	1.19E+01
Ethyl chloride	2.00E-06	0.00E+00	2.00E-06	Annual	2.32E-08	1.00E+04
Ethylbenzene	4.74E-02	0.00E+00	4.74E-02	Annual	5.50E-04	1.00E+03
				15-min	9.08E-03	4.35E+04
Ethylene dibromide	1.31E-05	0.00E+00	1.31E-05	Annual	1.52E-07	5.00E-02
				15-min	2.51E-06	2.31E+04
Ethylene dichloride	4.37E-04	0.00E+00	4.37E-04	24-hr	2.54E-05	4.83E+02
				15-min	8.37E-05	4.05E+04
Fluoranthene	2.45E-03	0.00E+00	2.45E-03	24-hr	1.42E-04	4.76E-01
Formaldehyde	6.73E+00	0.00E+00	6.73E+00	Annual	7.81E-02	7.70E-01
				15-min	1.29E+00	2.45E+02
Hexane	7.32E-04	0.00E+00	7.32E-04	Annual	8.50E-06	7.00E+02
				15-min	1.40E-04	3.50E+05
Hydrofluoric Acid	5.77E-03	0.00E+00	5.77E-03	24-hr	3.35E-04	5.85E+00
				15-min	1.11E-03	2.30E+02
Hydrogen chloride	2.91E+01	0.00E+00	2.91E+01	Annual	3.37E-01	2.00E+01
				15-min	5.57E+00	7.00E+02

Air Toxics Review Results
Air Toxics Impact Analysis
Yellow Pine Energy
Clay County, Georgia

HAPs/Toxics Pollutant[1]	Emission Rate (lb/hr)		Total Emission Rate	Averaging Period	Maximum Predicted Concentration	AAC[2]
Indeno(1,2,3,c,d)pyrene	1.33E-04	0.00E+00	1.33E-04	24-hr	7.72E-06	4.76E-01
Iron	1.51E+00	0.00E+00	1.51E+00	24-hr	8.79E-02	2.38E+01
Isophorone	6.33E-03	0.00E+00	6.33E-03	24-hr	3.68E-04	3.33E+02
				15-min	1.21E-03	2.83E+03
Lead[5]	2.75E-02	2.25E-04	2.77E-02	24-hr	1.86E-03	1.19E-01
Manganese	2.45E+00	1.50E-04	2.45E+00	Annual	2.84E-02	5.00E-02
				15-min	4.69E-01	5.00E+02
Mercury[5]	1.47E-03	7.50E-05	1.55E-03	Annual	3.46E-05	3.00E-01
				15-min	5.71E-04	1.00E+01
Methane	3.21E+01	0.00E+00	3.21E+01	24-hr	1.86E+00	1.56E+03
Methyl bromide	2.29E-02	0.00E+00	2.29E-02	Annual	2.66E-04	5.00E+00
				15-min	4.39E-03	7.77E+03
Methyl chloride	3.57E-02	0.00E+00	3.57E-02	Annual	4.15E-04	9.00E+01
				15-min	6.84E-03	4.13E+04
Methyl ethyl ketone	1.13E-02	0.00E+00	1.13E-02	Annual	1.31E-04	5.00E+03
				15-min	2.17E-03	8.85E+04
Methyl hydrazine	1.86E-03	0.00E+00	1.86E-03	24-hr	1.08E-04	4.49E-02
				15-min	3.56E-04	3.77E+01
Methyl methacrylate	2.18E-04	0.00E+00	2.18E-04	Annual	2.53E-06	7.00E+02
				15-min	4.18E-05	4.10E+04
Methyl tert butyl ether	3.82E-04	0.00E+00	3.82E-04	Annual	4.44E-06	3.00E+03
Methylene chloride	3.17E-03	0.00E+00	3.17E-03	24-hr	1.84E-04	4.14E+02
				15-min	6.07E-04	4.34E+04
Molybdenum	3.21E-03	0.00E+00	3.21E-03	24-hr	1.86E-04	1.19E+01
Naphthalene	1.48E-01	0.00E+00	1.48E-01	Annual	1.72E-03	3.00E+00
				15-min	2.84E-02	5.00E+03
Nickel	5.05E-02	7.50E-05	5.05E-02	Annual	6.04E-04	4.00E-03
Pentachlorophenol	7.80E-05	0.00E+00	7.80E-05	24-hr	4.53E-06	1.19E+00
Phenanthrene	1.07E-02	0.00E+00	1.07E-02	24-hr	6.21E-04	4.76E-01
Phenol	7.80E-02	0.00E+00	7.80E-02	24-hr	4.53E-03	4.52E+01
				15-min	1.49E-02	6.00E+03
Phosphorus	4.13E-02	0.00E+00	4.13E-02	24-hr	2.40E-03	2.38E-01
Propionaldehyde	9.33E-02	0.00E+00	9.33E-02	Annual	1.08E-03	8.00E-03
Pyrene	5.66E-03	0.00E+00	5.66E-03	24-hr	3.28E-04	4.76E-01
Selenium	4.36E-03	3.75E-04	4.74E-03	24-hr	6.92E-04	4.76E-01
Silver[4]	2.60E+00	0.00E+00	2.60E+00	24-hr	9.80E-02	2.38E-02
Styrene	2.91E+00	0.00E+00	2.91E+00	Annual	3.37E-02	1.00E+03
				15-min	5.57E-01	8.53E+04
Tetrachloroethylene	5.81E-02	0.00E+00	5.81E-02	24-hr	3.37E-03	1.61E+03
				15-min	1.11E-02	1.36E+05
Tin	3.52E-02	0.00E+00	3.52E-02	24-hr	2.04E-03	4.76E+00
Toluene	1.41E+00	0.00E+00	1.41E+00	Annual	1.63E-02	5.00E+03
				15-min	2.70E-01	1.13E+05
Trichloroethene	4.59E-02	0.00E+00	4.59E-02	24-hr	2.66E-03	1.28E+03
				15-min	8.79E-03	1.07E+05
Vanadium	1.50E-03	0.00E+00	1.50E-03	24-hr	8.70E-05	1.20E-01
				15-min	2.87E-04	5.00E+01
Vinyl acetate	8.30E-05	0.00E+00	8.30E-05	Annual	9.64E-07	2.00E+02
				15-min	1.59E-05	5.28E+03
Vinyl Chloride	2.75E-02	0.00E+00	2.75E-02	Annual	3.20E-04	2.30E-01
				15-min	5.27E-03	1.28E+03
Xylenes	3.82E-02	0.00E+00	3.82E-02	Annual	4.44E-04	1.00E+02
				15-min	7.32E-03	6.51E+04
Yttrium	4.59E-04	0.00E+00	4.59E-04	24-hr	2.66E-05	2.38E+00
Zinc	6.42E-01	1.00E-04	6.42E-01	24-hr	2.96E-01	1.20E+01
				15-min	9.76E-01	1.50E+03

	FB Boiler	Aux. Boiler
Maximum Predicted Concentration from SCREEN3 Model (ug/m^3) (based on 1 gram/sec)	1.152	23.2

Note:

1 Some of the the air toxic emissions are based on U.S. EPA AP-42 emission factors. Details on air toxic emission factors and emission calculations can be found in Appendix E.

2 AACs for annual averaging period are from U.S. EPA's Integrated Risk Information web site. AACs for 24-hr and 15-min averaging periods are from from OSHA/NIOSH TWAs and STELs (or ceiling limits).

3 Technical Memorandum dated November 1, 2005 from David Dixon to the Maine Air Toxics Initiative Emissions Inventory Subcommittee references a NCASI acrolein emission factor of 7.8 E-05 lb/MMBtu for wood-fired boilers.

4 Maximum predicted concentrations of arsenic and silver were obtained using the U.S. EPA's short-term Industrial Source Complex Model (ISCST3).

5 Lead and Mercury emission rates are based on BACT determination.